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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/553,490

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Stephen David Pollington

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EXAMINER

PATEL, SMITA S

ART UNIT

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1793

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/553,490	Applicant(s) POLLINGTON ET AL.	
	Examiner SMITA PATEL	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 November 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,8,28-32,35,37 and 42-54 is/are pending in the application.
- 4a) Of the above claim(s) 7 and 55 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,8,28-32,35,37,42-45,47 and 48 is/are rejected.
- 7) ☒ Claim(s) 46 and 49-54 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's amendment filed on November 16, 2009 has been entered.
2. Claims 1, 3-4, 8, 28-32, 35, 37 and 42-54 are pending. Applicant has amended Claims 1, 3, 31, 43, 44 and 50 and withdrawn Claims 7 and 55.

Information Disclosure Statement

- The information disclosure statement filed 08/19/2009 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.
- The information disclosure statement filed 08/19/2009 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because applicant has not submitted the copy of the cited NPL (Barry J. Cooper et al, "Role of NO in Diesel Particulate Emission Control", SAE Paper No.: 890404, Feb.1989). It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the

statement, including all certification requirements for statements under 37 CFR

1.97(e). See MPEP § 609.05(a).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Art Unit: 1793

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. **Claims 1, 3-4, 28-29, 43-45 and 47-48** rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 39, 42-47 and 59 of copending Application No. 11/665,308. Although the conflicting claims are not identical, they are not patentably distinct from each other because scope of claims 1, 3-4, 28-29, 43-45 and 47-48 overlap with claims 39, 42-47 and 59 of copending Application No. 11/665,308 which teaches a method of decomposing nitrogen dioxide to nitrogen monoxide in an exhaust gas or a lean-burn internal combustion engine which comprising of the method steps which are substantially similar to applicant's claimed invention .

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1793

4. **Claims 1, 3-4, 8 and 28-30** are rejected under 35 U.S.C. 103(a) as being unpatentable over Roth et al (US PG PUB 2002/0029564 A1) in view of Subramanian et al. (European Pub. No.: EP 0541271 A1).

As per Claims 1 and 3, Roth teaches reducing the catalytic converter has a metal or cordierite monolith substrate with a catalyst washcoat including acid zeolite such as ZSM-5 zeolite with base metals or precious metals group such as palladium (paragraphs 0081-0082). Further Roth teaches adjusting the C1HC:NO_x ratio of exhaust gas more than 0.5 to produce desired conversion percentages of reduced NO_x (paragraphs 0063-0064). Roth does not expressively mention passing the effluent gas from the contacting step to atmosphere.

However, Subramanian teaches a method of treating the exhaust gas from fossil-fueled engine comprising operating the engine under lean-burn conditions while controlling the emission ratio of NO_x:hydrocarbon to be in range of 1:3 to 3:1 (encompasses the molar ratio of HC: NO_x); exposing the exhaust gas to a first catalyst stage comprising mixture of Cu-ZSM5 and exposing the effluent from said first catalyst stage to second catalyst stage (passing the effluent gas from contacting step) comprising an alumina support impregnated with an intimate mixture of lanthanum and palladium (abstract).

It would have been obvious to one of the ordinary skill in the art at the time of invention to combine Roth with Subramanian to improve the conversion efficiency of HC and NO_x as taught by Subramanian.

As per Claim 4, Subramanian teaches the temperature of 400° C (encompasses claimed range).

Art Unit: 1793

As per Claim 8, Subramanian teaches zeolite is selected from group consisting of ZSM-5 (abstract).

Roth teaches zeolite is selected from group consisting of ZSM-5 (paragraph 0081).

As per Claim 28, Subramanian teaches the step adjusting the HC:NOx ratio is effected by in response to the following inputs: Spark timing (considered as ignition timing), engine speed, and lambda value of the exhaust gas (page 3 lines 1-15).

Roth teaches the step adjusting the HC: NOx ratio is effected by in response to the following inputs: catalyst bed temperature, engine speed, throttle position, exhaust gas temperature, and rate of exhaust gas mass flow.

As per Claim 29, Roth teaches adjusting the C1 HC:NOx ratio is operated according to stored look-up tables or an engine map in response to the at least one input (paragraphs 0085-0092).

As per Claim 30, Subramanian teaches the step of adjusting the HC:NOx ratio comprises at least adjusting air fuel ratio (Col.3 lines 1-15).

Roth teaches the step of adjusting the HC:NOx ratio comprises at least adjusting air fuel ratio (paragraph 0100).

5. **Claims 31-32, 35, 37 and 42** are rejected under 35 U.S.C. 103(a) as being unpatentable over Roth et al (US PGPUB 2002/0029564 A1) in view of Subramanian et al. (European Pub. No.: EP 0541271 A1) and in further view of Murachi et al (European Pub. No.: EPO 758713 A1).

Art Unit: 1793

As per Claims 31, 32, 35, 37 and 42, Roth teaches contacting the exhaust gas with an oxidation catalyst comprising at least one platinum group metal such as palladium or platinum but does not expressively mention NO₂ decomposition catalyst is disposed downstream of the oxidation catalyst.

Subramanian teaches a method of treating the exhaust gas from fossil-fueled engine comprising operating the engine under lean-burn conditions but does not expressively mention contacting exhaust gas with oxidation catalyst comprising at least one PGM where in NO₂ decomposition catalyst is disposed downstream of the oxidation catalyst. However, Murachi teaches further comprising contacting exhaust gas with oxidation catalyst such as platinum-based (considered PGM metal) oxidation wherein NO₂ decomposition catalyst is disposed downstream of the oxidation catalyst, particulate filter disposed between the oxidation catalyst , the NO₂ decomposition catalyst and NO₂ decomposition catalyst disposed on a downstream end of the filter and injecting a reductant into exhaust system upstream of the NO₂ decomposition catalyst (abstract, Col.4 lines 16-24 and 50-59, Col.5 lines 1-43, Col.16 lines 15-23 and 34-59 and Col.17 lines 1-24 and 45-55).

It would have been obvious to one of the ordinary skill in the art at the time of invention to combine Roth with Subramanian to improve the conversion efficiency of HC and NO_x as taught by Subramanian. Further it would have been obvious to combine Roth and Subramanian with Murachi to include NO₂ decomposition catalyst disposed downstream of the oxidation catalyst to .

Allowable Subject Matter

- Claims 43-54 are allowable upon filing of appropriate terminal disclaimer to remove the double patenting rejection. Applicant needs to further cancel withdrawn non-elected claims 7 and 55 as response filed on 02/17/2009.

Response to Amendment

Applicant's arguments filed on November 16, 2009 have been fully considered but they are not persuasive. Applicant has amended Claims 1, 3, 31, 43, 44 and 50 which necessitated new ground of rejection. See new ground of rejection above and therefore, the applicant's arguments, filed on 11/16/2009, are moot in view of the new ground(s) of rejection.

Regarding to applicant argument to 35 U.S.C. 112 second paragraph. Examiner respectfully withdraws the rejection.

Regarding to Double Patenting rejection. Examiner respectfully maintains the rejection until appropriate terminal disclaimer is filed.

Regarding to using Murachi and Subramanian references. Applicant argues that Murachi and Subramanian fails to disclose or suggest contacting gas mixture from the adjusting step with pa particulate acidic refractory oxide selected from the group consisting of zeolites, tungsten-doped titania, silica-titania, zirconia-titania, and mixtures of any two or more thereof wherein the particulate refractory oxide supports the metal of rhodium, palladium, or mixtures of thereof. However, examiner has added new reference taught by Roth which teaches contacting gas mixture from the adjusting step with zeolite (refractory oxide) that supports base metal or precious metal group such as

Art Unit: 1793

palladium (considered metal). Therefore the combination of Roth, Subramanian and Murachi teaches the claimed invention. However, if the applicant believes that the pending claims are distinct from the cited prior art, the applicant needs to further modify the claim limitation/language to clarify the claim subject matter for further consideration and distinction from the prior art.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SMITA PATEL whose telephone number is (571)270-5837. The examiner can normally be reached on Monday-Thursday, 8:00-5:00pm.

Art Unit: 1793

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Melvin Curtis Mayes can be reached on 571-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SP, Art Unit 1793
03/08/2010

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793